That Showed Very Great

has four cylinders of 190x250 mm. bore

and stroke, giving a piston displacement

put into a chassis.

Although of such unusual size, the

power racing car with an engine very much lighter and more efficient than the

one now in retirement. Indeed if th

AUTOMOBILE SCHOOL

LADIES AND MEN
LEARN HOW TO
Save gasoline, use less oil, centrol the sthrk and keep an engine FREE OF CARBON.
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THE MOTOR OMNIBUS IDEA SHOULD BE FURTHERED

The Twelfth of a Series of Articles on Motor Truck Cost and Performance-Written for Business Men by an Expert.

Car cleaners
Oliers
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Carpenters
Carpenters
Carpenters
Carpenters
Hiscksmiths
Hiscksmiths
Hiscksmiths

AUTO TRADE BRISK

and other points, and the story is the same—a general revival of business and fine prospects for the next few months

The chief concern is over the possibil-ity of getting enough cars."

SPLITDORF PATENTS

C. W. Curtiss Explains Action of

Federal Trade Commission.

certain Bosch patents, various conflicting

the Secretary of War at the direction of the President of the United States in connection with magnetos for war air-

Fig. 1—Patent 1030817 showing the binding post.

Fig. 1—Patent 1014824 showing electric ignition system.

ъ.

By GEORGE W. GRUPP.

The natural born enemy of the street railway company is the motor omnibus. This for the reason that it is less expensive to operate than an electric railway in that there is no necessity of having to maintain readbeds, power houses, tracks, &c.

A new opportunity is bound to knock at the motor omnibus idea if the rail.

at the motor omnibus idea if the rail-ways are granted their passenger fare

increase. This will place the motor complete with the railways.

Opportunity has knocked on the door of the motor omnibus idea within the last few weeks. I refer to the increase hast few weeks. I refer to the increase granted to the railroads for passenger traffic. Why not operate motor omnipuses for intercity service on a far larger scale than is already being done? In the State of California this latter idea has taken fast hold within the last few years, until to-day there are scores of lines operating out of most of the hig centres to the smaller ones. Some of these lines run over 100 miles.

During the war railroads have cut

During the war railroads have cut down their passenger service to give greater attention to the much needed freight tonnage. This has necessitated a longer wait for some people who were anxious to get to a short distance point. Then, too, a lot of them stay at home because they could not see their way clear to make the journey with the in-crease in fare. All of this automatically suggests that the motor truck should be brought into play. Why not? Motor trucks can easily be made into motor

it cost to operate a motor omnibus line? For this reason the writer sought out the cost figures of the Fifth Avenue Coach

Perhaps the first great motor comb-bus line in this country is the Fifth Avenue Coach Company of New York city. To-day, beyond a doubt, it is the strongest and biggest line of its kind in the United States. Ever since it first legan to do business, way back in 1887. first with horse driven omnibuses, it has once let the idea of retting the maximum results at the minimum cost of time, labor and money get away from it. Its fleet of 176 omnibuses, twentyfive road acrapers, three sandshakers and extra equipment are housed in an excellent garage on East 103d street just a few hundred feet from Fifth avejust a few hundred teet from Fitth avenue. This structure, which occupies a site 250×100 feet and has a floor area of 75,000 square feet, is of the steel frame type with reemforced concrete floors. Extraordinarily large elevators arry the buses from floor to floor.

Without going into the detail of the equipment of the garage it will suffice to ay that they have every possible appliance to make every kind of repair. In fact, they build their omnibuses them-selves. After one makes a detailed stady of some of the figures which will follow-one can gather the kinds/of men they employ and the many departments they must have in their garage.

One of the most rigidly enforced rules of the company is to never leave a car out which has not been thoroughly cleaned and which is not in good remain They believe that an "ounce of preven-tion is worth more than a pound of

ule. This schedule is changed four times a year. As a careful check is kept of the traffic, these schedules are changed to

if the prevailing conditions.
All of the omnibuses are heated by engine exhaust pipe radiators during the engine exhaust pape radiators during the three is drawn of the United States in winter months. By means of storage connection with magnetos for war airbatteries the cars are lighted. The in-batteries the cars are lighted. The inplane purposes. The patents do not relate in the remotest degree to the printeriors of the buses have every appearable of an up to date street car. Fifty-cole of construction embodied in the seven of these buses have been in configurations of the cooling system and built of the United States in the remotest degree to war airbatteries the cars are lighted. The inplane purposes. The patents do not relate in the remotest degree to the printeriors of the buses have been in configuration of these buses have been in configuration of the cooling system and built of the United States in the remotest degree to warm up ables one magneto to be used for 4, 6, 8, the speed that was expected of it, printeriors of the buses have been in configuration of the coling and the cooling an invoss operation since 1995, twenty-four since 1914, five platents owned or operated under by the since 1915, twenty-seven alone 1914 and platents owned or operated under by the since 1917. One hundred and thirty-two since 1917. One hundred and thirty-four passengers and thirty-five interest to eaten thirty-five to forty-five to five the time time the case of the subdivict to

GENERAL EXPENSES	Per Per bus bus mile hour	
Ealaries and expenses— general officers \$7.417.58 Salaries and expenses— general office clerks 8.522.00 General office supplies and expenses 1.886.00 General law expenses 7.886.17 Fetrance 14.005.94 Misc general expenses 77.92.64 Accidents and damages 11.005.98 Claim dept. expenses 8.004.24	.06 .001 .00 .001 .15 .011 .34 .011 .48 .001 .19 .011	attaching a case to a magneto and some of them covered by Splitdorf pagent applications pending may even be fref- erable to the one shown in the patent, but as this was already being used abroad it was adopted as standard here. The accompanying figure taken from this patent.
Medical expenses 1,730.50 Other injuries and dam- ares 2,156.08 Other expenses 110.00 Law expenses 110.00 Law expenses of attorneys 6,997.50	1.06 .05	Fig.1.
Court costs and exp. 2.40.62 Law printing General stationery and printing Todarchouted adjustment balance	.64 .00 .67 .00	a
Totals		2 g

	-	-
\$154,075,77	\$3.63	\$0.21
SPORTA	TION	ž.
Total	bus	Per bus hour
\$76,187,04 176,845,57 15,436,71 286,473,68 218,461,78		\$0,104 .244 .021 .800
9.948.20 15,420,68	.14 .13	.011
29,300 43 15,763 64 4,140 98	.66 .60 .21	,041 ,041 ,020 ,000
	.08	.000
\$897,291.68	\$15.83	\$1.544
	TOTAL TOTAL TOTAL TOTAL TIC. 205 547 15. 436. 512 205. 67268 218. 461. 73 8. 342. 20 218. 461. 73 8. 342. 20 218. 475. 84 4. 446. 34 4. 4567. 54 11. 660. 52	Total bis mile 176, 287, 587, 647, 64 577 3.01 15, 436, 27 218, 461, 73 2.73 2.83, 461, 73 2.73 2.83, 461, 75 28 200, 48, 487, 584, 584, 584, 584, 584, 584, 584, 584

Totals				"Patent 1014824 relates to an ignition system, wherein a high tension starting magneto is connected to the main mag-	
	Total	Per bus mile	Per bus hour	neto in such a way that the starting magneto may be operated by hand in order to furnish a starting spark. The	
Euperintendence	641,402,69	\$0.71	80.063	accompanying figure from patent 1014824	
Renairs of shop tools and machinery	5,458.15 1,784.54	.00	,002	Fig.1.	
Renairs of omnibus bod-	11,506.79	, AG	.016		
Estate of omnibus bod-	14.201.40	.24	.000	1 th 10 At	
Bendre of omnibus chas-	25,910.66	.44	.00F	The state of the s	
Personation of tires. 8 Fereign on service cars. 4 Fereign of equipm't. Fereign of shop tools and machinery. 6	64,891,61 89,769,78 44,886,55 2,488,53	1.11 1.51 1.01	,001 ,175 ,064 ,668		
	67,991,81 4,467,67 561,48	1.18 .66	.001 .000		
Total maintenance exp.	\$275,079,25	\$6.15	10.524		

EMPLOYED IN YEAR ENDING JUNE 20, 1917.	HEY
General offices Shoral offices Chor offices Chor offices Cerks and bookkeners, men Cerks and bookkeners, men Cerks and bookkeners, men Cerks and bookkeners, men	6,6 2,2 48,6 5,1 1,0 13,7
1978 Leaders	14.2 3.5 4.2

A Very Novel Premier Model.



Here is a Premier touring limousine sedan. By removing the op over the driver's sent one may have a anappy town car. This model is one of the biggest sellers at the Kaufmann-Morris Com-

with Peace Close at Hand Many Persons Get Orders In.

"On the basis of the war being over an unusual boom in the automobile business is noticeable as the way to peace is clearer," says E. A. Schou. Eastern manager of the King Motor Car. Company and general manager of the Main magneto. As soon as the east to peace is clearer," says E. A. Schou. Eastern manager of the King Motor Car. Company and general manager of the main magneto. It is many foreign in the local King 8 organisation. "Many automobile prospects who held up their orders when peace seemed far off decided to buy during the past ten days and we have been buay delivering cars. This surely is a fine indication of the way the people will 'Come back' when the pressure of war is finally lifted.

"Pracent conditions too are a warning, because with the present manufacturing facilities dealers cannot hope to meet even the first rush for cars. One hears considerable talk about lots of mars being in New York waiting for cars. One hears considerable talk about lots of mars being in New York waiting for cars. One hears considerable talk about lots of market. There are many cars here, but not enough to meet a regular peace time of reference on form the starting magneto is standard to many foreign the same results, and this past is desirable for the reason stated.

"Pracent conditions too are a warning, because with the present manufacturing facilities dealers cannot hope to meet a regular peace time a market. There are many cars here, but not enough to meet a regular peace time a market. There are many cars here, but not enough to meet a regular peace time a market of prospects. Therefore it is important for the man who wants to be sure of getting his car at once to get his order in without delay.

"One must not forget that the number of prospects who during the past eight-off prospects who during the past

"One must not forget that the number great quantities to meet the present of prospects who during the past eightern months decided to hold off until the pany now being the largest manufacture. standardized and is being produced in great quantities to meet the present of 1,739 cubic inches. emergency, the Splitdorf Electrical Com-

the war, certain Dixie magnetos under the Splitdorf Dixie patents, therefore three sources of supply for the Dixie magneto are available. In addition the Splitdorf company will furnish the nec- was only a little time after this match at the will of the driver, who has a con essary drawings and engineering infor-mation so that the product of all three factories will be standard, uniform and nterchangeable.



Harry De Bear Will Exhibit
Closed Models.

Club of France attempted to break the record. Electrically timed, he covered the kilometer on several occasions at an average sped of 143 miles an hour. One

Harry J. De Bear, manager of the of the international racing rules stipulates that flying kilometer records must be run in both directions and the aver-Sales Corporation, has just announced a closed car exhibition of all Maxwell and Chaimers models, to be held at the Company's salesrooms, 1808 Broadway, corner of fifty-ninth street, during the week of November 11th to the 16th inclusive. During this display there will be shown many different body types on both Maxwell and Chalmers chassis.

be shown many different body types on both Maxwell and Chaimers chassis, which gives a range in price from \$1,345 to \$3,500.

"I certainly feel," said Mr. De Bear, "that we are exceptionally fortunate in having such an excellent assortment of closed models to select from during times like these. Those who require cars and who still are anxious to do a patriotic service by economical chassis. Many people who have used closed cars in the winter time and who are accustomed to expensive ones have felt that it was their duty not to purchase cars this year on account of the large outlay of money necessitated. However, they will now have an opportunity to secure exactly the model they desire at a low cost.

"Both the Maxwell and Chalmers cars enjoy enviable reputations as economy record holders, and it was with this thought that we decided to make up a complete line of closed cars in both models."

the shown many different was season, which are is no doubt that he has attained the his chapted in the world. The Russian roads were of the opinion that the 3car for he found that it was too fast for Russian roads, and the French authorities were of the opinion that the 3car horse-power monster was not safe for Russian roads, and the French authorities were of the opinion that the 3car horse-power monster was not safe for Russian roads were of the opinion that the 3car horse-power monster was not safe for Russian roads, and the French authorities were of the opinion that the 3car horse-power monster was not safe for Russian roads, and the French authorities who examino and approve every new of the opinion that the 3car horse-power monster was not safe for Russian roads, and the French authorities was not safe for Russian roads, and the French authorities who examino and approve every new of the opinion that the 3car horse-power the sold for the safe for the form during times in the building of such big racing engines is the safe for the safe for the safe for Russian roads, and the French authorities was not safe for Russian

rive at this size and power without con-siderable difficulty.

It is quite possible that after the war many car manufacturers will be tempted to put their big aviation engines in a chassis for test purposes and short dis-tance records. The Fiat company, for instance, could build another 300 horseshows the Bosch type of binding post employing a pointed screw piercing the cor sector and securing it in place in the

A NEW CROSS-COUNTRY RUN.

Goodyear Company Sends Two Trucks on Paeumatics. On the last lap of a round trip between Boston and San Francisco a Packard and White truck of five tons capacity each and running on pneumatic tires passed through here Friday. matic tires passed through here Friday. These trucks left Boston on September 23 and made the run to San Francisco, a distance of 3,717 miles, in twenty-one

a distance of \$7.71 fines, in twenty-one days.

This is the first time trucks equipped with pneumatic tires ever made such a long run. These trucks were equipped with Goodyears, \$7x7 on the front wheels and 44x10 on the rear wheels. Only seven tire changes were made. Each truck loaded weighed about 18,000 records.

pounds.

The trip is important because it was

MOTOR EFFICIENCY IN COLD WEATHER

frigid engine, as the owner likes to have it start-on the first turn. Yet by taking a few simple precautions the motorist may obviate most of the trouble and have reasonable engine efficiency; even in the zipplest weather. Hard starting in cool weather has

tordom. In the early days of the motor era we had superfine gasolene, but the engines in which we burned it were so crude that they were difficult to start Interesting History of the Car any way. Now we have excellent engines, but our gasolene has deteriorated so that starting troubles are, if anything, more prevalent than they were. Fortunately this eltuation has led to

always been a chronic disease in mo-

the invention of many devices and mato which is the biggest and most powerful motor car ever used successfully on the road. The record for greatness in this ongine. Even in the sunny southland respect appears to lie with the 300 and in California there are many mornhorse-power Flat built in 1911 and raced lings in winter when the car owner is in 1912 and 1913. This car, which is afforded him. now in retirement at the Fiat factory,

Undoubtedly the best method of get ting an easy start in cold weather is priming. Those of us who are veterans at the game have primed religiously for There is a general impression that years, opening the petcocks and pouring war was over has been steadily increased. Then there are many men who have been put into the automobile prospect class by better incomes received as the result of war activities. Finally there is the natural increase in prospects, as men have assumed more important positions in the business world. "During the past week I have had "During the past week I have had and other points, and the story is the lightly and only for the duration of the war, certain Dixie magnetos under and other points, and the story is the lightly and only for the duration of the war, certain Dixie magnetos under the season was run at Brook. Nazarro, this huge racing car was run at Brook. Nazarro, this huge racing car was run at Brook. Nazarro, this huge racing car was run at Brook. Nazarro, this huge racing car was run at Brook. Nazarro, and it is huge racing car was run at Brook. Nazarro, this huge racing car was run at Brook. Nazarro, and his hy the Italian crack. Nazarro, such is not the case, however. Nazarro raced on Brooklynds track with Mephistophies—another huge motor car—in a there are on the market now a number tophieles—another huge motor car—in a constitution, and the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his seat and propriate the operator can sit in his huge racing car was run at Brook. infor- that the Flat company decided to at- trol, usually in the form of a pump, tempt to secure the world's flying kilo- conveniently placed. A primer outfit of meter record, and as Mephistopheses was this kind may be purchased at a cost then in the hands of a private owner, Sir George Abercromby, Bart, the company installed by any one who is mechanical designed and built the 200 horse-power enough to be fit to drive a car. enough to be fit to drive a car.

er, which has the biggest engine ever Now as to the question of what to put in the primer. There is nothing much better than 76 degree Pennsylfour cylinders are a bloc casting with enclosed overhead valves. This together with the long stroke made a very high vania gasoiene or its equivalent fuels from the other fields. This practically the fuel we used to get ngine, and although there is not an inch the old days when the motor car was waste space under the bonnet, it stands feet 7 inches from the ground. The ar has four speeds and chain drive. a newcomer on the roads of America and it will fire every time on the first turn if there is a reasonably good spark. When racing the mechanic is entirely some of the companies put out a produc idden under the big cowl.

It had been aranged for Nazarro, then known as "petroleum ether," which simply one of the lighter products distillation and makes an admiraat the height of his fame, to drive the new racer on Brooklands track, and with this object in view he tested the car sev-eral times on Italian roads. However, starting fuel. In the old days, when most of us lighted by acetylene, it was possible to have the gas tank adapted for use as a primer, and this too served a few weeks before the tests in England

Nazarro declined to establish his own excellently well. motor car factory and his connection. There are a number of tried and with the Fiat racing department was true old fashioned methods of assisting severed. The car was turned over to the start in cold weather; for instance. Bordino, another Italian driver, who took there is dratning the cooling system and

the start. With our present grades of fuel there is a constant tendency to ward condensation. Even after the gaselene has been carbureted and is on its way to the combustion chamber it is quite likely to condense on the sides of the manifold if these become chilled. For this reason it is necessary to use as much heat as possible in connection with the carbure on system. The alter the mixture should be taken from around the exhaust manifold, so that it will be heated. This is easily arrange wil be heated. This is easily arranged by means of a so-called stove and flex-lible tubing. Many carbureters are now fitted with hot water jackets, and it would be a good thing if all of them had such equipment. In cases where a car owner has had unusual trouble with lowered engine efficiency in cold weather will have him to invested as will pay him to install a tacketed instrument in place of his old one. This question of engine efficiency is more important than might appear at first rlance. The Fuel Administration in Washington has asked us all to be as saving as possible with gasolene. Now the two terms are synonymous, and 1 s our duty to get the last ounce ower out of every gallon of fuel we

Last winter was signalized by the appearance of a considerable number of so-called "hot spots." This simply means an area of the intake manifold heated, so that the fuel vapor passing heated, so that the fuel vapor passing over it is heated and goes to the combustion chamber with plenty of snap and vim in it. These hot spots are usually obtained through connection with the exhaust manifold, and they undoubtedly contribute to engine efficiency in cold weather. In this connection it may be reced that a but snot does not conne noted that a hot spot does not contribute to easy starting for the simple

> To help conserve Rubber we have opened our Repair Dept to the Rubio LIRE

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> OUR PRICE NO HIGHER THAN ORDINARY VULCANIZING. SEAD US YOUR OLD TIRES AAD WE WILL TELL YOU IF THEY ARE WORTH REDAIRING-IF NOT WE WILL ETHER RETURN THEN OR BUY THEN AT MARKET PRICES, AS YOU CHOOSE

AMERICAN RUBBER CORPORATION

until the engine has been running long enough to heat the exhaust. This is BUSINESS HOUSES by by lous, though many motorists fell into

orror in this respect last winter.

One of the best investments for winter engine "wear" is a covering for the radiator and hood. This is made up in leather or imitation, lined with felt, so that it is almost impervious to the cold. The front is so made that part With Small Tractor Trucks Pointers for the Man Who Wants to Keep Going

All Winter.

This is the season of the year when the motorist may be excused if he somewhat petulently misquotes: "Now is the winter of our discontent upon us." Soon the chilly mornings will begin to threaten the chilly mornings will begin to threaten the cold. The front is so made that part or all of the radiator may be covered up as the needs of the weather indicate. With one of these covers over the hood and the curtain in front down over the radiator the engine will retain its vital heat for a surprisingly long time even in zero weather. Beyond a doubt these covers are worth all they cost.

Finally, the storage battery must be carefully looked after. If the electroling the hauling requirements of the lytle is kept up to strength it will not freeze, but if it is allowed to become weak it will probably freeze, being little Broadway. "With peace declared the

the chilly mornings will begin to threaten the chilly mornings will begin to threaten weak it will probably freeze, being little weak it will probably freeze, being little weak it will probably freeze, being little zero, or at any rate a thermometer low battery should be kept fully charged all the time. The spark plug gaps must be watched and set so that they are not too

invested in devices of approved merit, a few precautions, a little reasonable care, and there is no reason why engine effi-ciency should not be maintained even in the coldest winter that our far flung ountry produces.

PRACTICAL PARAGRAPHS.

Connecting Rod Knock.

The knock ordinarily produced by a cose connecting rod is rather in the nature of a pound, and it is most noticeable at slow speed with a closed throttle. If the play is excessive, however, the knock will be heard at all speeds and knock will be heard at all speeds and with a trailer carpable of handling three ture of a pound, and it is most noticeable at slow speed with a closed throttle. If the play is excessive, however, the knock will be heard at all speeds and loads. This is probably the commonest to four tons is much less expensive than a single truck unit of three to four tons is much less expensive than a single truck unit of three to four tons is much less expensive than a single truck unit of three to four tons is much less expensive than a single truck unit of three to four tons is much less expensive than a single truck unit of three to four tons is much less expensive than a single truck unit of three to four tons is much less expensive than a single truck unit of three to four tons and the variety.

half down or a side plate off remove a valve cap or spark plug and turn the this kind the trailer can be loaded and songine over, so that the piston is at top dead centre, in such a position that a screwdriver may be pressed down on top of the piston, while with a bar the piston may be pushed upward from the under side. So by alternately forcing up and down any play existing may be defected.

similar piece of soft metal. If a tempered metal instrument is used in this operation the guide will probably be eral 1% ton trucks are almost unbalanced in the soft metal.

that has caused the trouble and remove the cause if it is still present. The rough-est edges should then be smoothed off with whatever means are at hand. Next thoroughly clean piston and cylinder, replace the parts and supply additional oil to help fill in the scratches.

Sooted Plus.

When a spark plug develope missing as a result of being scoted and no means of removal is at hand, as may happen sometimes on the road, the plug can be made to fire regularly again by disconnecting the lead and introducing an auxiliary again. auxiliary gap of one-eighth or one ter between it and the plug terminal.

Tappet Clearance.

A backfire or "pop" back through the carbureter may indicate insufficient incharge escapes through the valve and ignites an incoming charge in the man-ifold. The loss of compression also causes loss of power and the gas blown back deranges the carbureting system for the time being.

The principal causes of flooding of the carbureter may be listed as follows: Needle valve being held open or leaking. due, perhaps, to dirt on the valve seat, preventing its closing properly. Imperfect or worn needle valve or seat, Sticking mechanism. A float too heavy or leaking, causing it to sink too deep, holding the needle valve open. Level too high. Loose neggie or needle.

Emergency Pipe Splice. When the fuel line suffers a fracture on the road there are a number of emergency repairs that may be made. rubber tubing is available a section of this will make an admirable splice. A cork with a hole through it may be used and in the absence of one a raw potato with a hole through it makes very satisfactory temporory splice. Cloth smeared with soap or shellac and then reenforced with splints is very handy.

REPORTS GOOD BUSINESS.

Chandler Distributer Finds Man; Anxions to Buy.

automobile business is unusuall good and we wonder where we are going o get the cars to meet the demand."

says J. B. Hulett of the Brady-Murray

Motors Corporation, the Chandler distributers.

"The situation is a perfectly natural the situation is a partectly natural ine. With the end of the war here people are not going to be without automobile any longer. War activities have accentuated the great value of the automobile and have had much to do with the "We are preparing for big business

during the next few months, and our only concern is over getting enough cars."

NOW USE TRAILERS

Broadway. "With peace declared the question of the best way to move the immense amount of goods that will be required in the great after the war readjustment is receiving very carefu consideration by business men.

"Already such well known concerns as the Dupont Powder Works, Austin-Nichols, American Can Company, Sears-Roebuck and Borden's Condensed Milk Company are using the small tractor truck and trailer as the most economic method of motor hauling. This action followed the indorsement of this com-

chock will be heard at all speeds and with a trailer capable of handling three loads. This is probably the commonest to four tons is much less expensive than should be remedied without any delay or worse trouble will follow.

Piston Pin Piny.

It is sometimes a little difficult to determine whether there has been wear truck and trailer capable of handling three to four tons is much less expensive than a single truck unit of three to four tons capacity. The latter always has its own dead weight to carry around and often is not loaded to capacity. This means much greater wear and tear and expense. When it comes to the trailor capable of handling three to four tons is much less expensive than the same way and the same and the same and the carry around and often is not loaded to capacity. This means much greater wear and tear and expense. When it comes to the trailor capable of handling three to four tons capacity. The latter always has its own dead weight to carry around and often is not loaded to capacity. This means much greater wear and tear and expense. It is sometimes a little difficult to de-termine whether there has been wear in the piston pin bearing. With the piston in place and the lower crankcase platen in place and the lower crankcase half down or a side plate off remove a while the truck is away with a load of Removing Valve Stem Guides.

In removing valve stem guides, which are driven out from the top, be sure and use either a block of hard wood or a similar piece of soft matal. If a small it is being loaded,

re slightly scored it may be possible the railroads congested the trackless make an emergency repair for tember of the fraction of the problem compressed. The first thing to do not take out the piston and find out pictely. The distribution of weight over and trailers solve the problem com-pletely. The distribution of weight over a truck and trailer makes the wear and patch must be trimmed so that the tire tear lighter both on the equipment and will run smoothly. "The days of renewed business activi

ty at hand will call for increased speed in the handling of freight. Small units smooth running possible. Bumping on with large carrying capacity when a tire ruins the inner fabric; the regular and continuous shock breaks and many a problem that now looks difficult. The era of the truck and trailer "When the tire fabric has been sert-

SOME USEFUL TIRE TIPS. in Expert Emphasises Importanc

of Correct Repairing. Motorists who are tired of being led red about the harm done to tires by

partly on other shoulders.
"While it is true that most of the tire injuries which come to our atter-tion have been caused by careless drive ing, they have usually been aggravated by bad repairing," says A. J. Peebles, manager of New York Tire Service, Inc., 1969 Broadway, distributors of United States Tires.

"A good repair man is hard to find. He must know everything about the complex structure of tires, be interested enough to study the particular injured tires brought to him, and careful in

We have found that former workers



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ILL DAYTON ENGINEERING LABORATORIES CO. DAYTON OHIO.

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F. R. VALPEY



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is under complete control-both as to schedule and expenses. Gray & Davis Starting and Lighting.

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> Dependable Delivery HILBER MOTORS OBE'N ALLINTOWN, I

The Liberty Engine

N the latter part of the year 1914 the Packard Motor Car Company decided to go extensively into the development of air motors. It had received one of the Mercedes motors used by the Germans in their airplanes, which had been imported in a racing chassis. Taking certain features from that motor and from other motors an engine was designed in 1915, a duplicate of which was used in a racing car. This engine developed 140 horse-power at 3,000 revolutions per minute. Another model with greater power was com-pleted in December, 1918, and was also used in a racing car. This was rated at 200 horse-power at 2,180 revolutions per minute. It was described in a pamphlet exhibited at the Aeronautical Show in New York in January, 1917, as "The Packard Aircraft Engine," exhibited "as a stimulant to the new aviation indus-

tors had been under the direction of J. C. Vincent, then vice-president of the Packard Motor Car Company in charge of engineering. In the latter part of May, 1917. Mr. Vincent took his drawings to Washington for the purpose of laying before the Govern-ment the plan of the Packard com-pany to manufacture these engines in arge quantities through enlisting the aid of other automobile manufac turers who had experience in high grade motor work. Mr. Vincent met Mr. Deeds, Mr. Walden and others. The design was not deemed to be adequate for the needs of the western front and it was necessary to increase the horse-power of the mo-tor with lighter weight per horse-power. Mr. Vincent worked in Washington in conjunction with E. J. Hall of the Hall-Scott Company, making sketches for the purpose of improving the motor, and in a few days a new motor was designed embodying to a considerable extent the engineering features which had been devel-oped during the past two years of experimental work.

The above extract is from the re-

port of Charles E. Hughes, submitted to President Wilson on October 25, 1918, as a result of Mr. Hughes's investigation into the circust situa-

tire factories who have learned all ne processes make the best repair men They know tires as well as the experi who designed them.
"The simplest form of injury to tires

of traffers used in connection with several 115 ton trucks are almost unbelievable. Such an outfit would correspond to the cars of the railroad train, a system of baggage and freight transportation which has been found to be portation which has been found to be most ideal for the best results. With most ideal for the best results, with railroads congested the trackless must be heated so that the patch is welded in with the other structure. is a cut, but even this requires careful

"Repairing the tread is important, not only because it improves the appear-ance of the tire but because it makes

"When the tire fabric has been seri-ously injured an entirely new section must be inserted; that is, about eight inches of tire must be rebuilt. The re-pair man must exercise as much care as he workmen and inspectors in the facory where the tire was made.
"The most important qualification of

repair man is the ability to judge when a tire is so worn that the cost of repairing will not be justified by the additional mileage obtained. Our men reject as beyond repair very few of the tires that come to them."

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Broadway at 63d. St. Col. 907

shows this arrangement.

"The main magneto A is connected to the spark plugs in the usual manner. From the distributer of the main magneto I and when the latter is netto a cable P is connected to the starting magneto I and when the latter is rotated by means of the crank N high tension current will flow into the distributer of the main magneto, where it is tributer of the main magneto, where it is tributer of the main magneto, where it is distributed by means of an nuxiliary brush located behind the usual moving of the country.

The trip is important because it was in the nature of pioneer work leading to the opening up of motor truck high-ways in sections where transportation facilities are as yet undeveloped. As the motor truck is going to be a tre-mendous factor in after the war freight hauling the Goodyear Tire and Rubber country.

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